variability of coronary measurements was also assessed in 23 patients who had 2 angiograms, a median of 21 days apart. The mean (±SD) of the difference between the 2 measurements was 0.09 ± 0.28 mm for RD, 0.06 ± 0.30 mm for MLD, 1.5 ± 9.1% for DS, and 0.32 ± 1.7 mm for lesion length. Less than 1 hour of training was needed for learning how to use this system efficiently.

1055 Computers in Cardiology

Wednesday, March 22, 1995, 1:30 p.m.–5:00 p.m. Ernest N. Morial Convention Center, Hall B

1055-1 A Program for Digitization of ECG Tracings on Paper and Accurate Interactive Measurement of QT Intervals and ECG Parameters of Dispersion of Ventricular Repolarization

Markus Zabel, Stuart Portnoy, Ross D. Fletcher, Michael R. Franz. *VA and Georgetown University Divisions of Cardiology, Washington, DC*

QT dispersion from the 12 lead ECG has been extensively evaluated as a risk parameter in pts prone to arrhythmias. Usually, this parameter is assessed directly from the ECG tracing by means of a magnifying glass and a digitizing pad with reproducibility and accuracy not being optimal.

We therefore developed a software program with a graphical interface permitting conversion of a scanned image of the ECG on paper to a digital ECG function (sampling rate 500 or 1000 Hz) which can then be analyzed by a second interactive computer program for standard ECG intervals, QT dispersion and other repolarization parameters (JTpeak, T areas, T peak to T end interval). Digitally available ECGs can also be converted to a format analyzable by the program.

The respective signals are processed channel-by-channel with enlarged high resolution display on a 20" computer screen. The computer program uses customized algorithms to detect important features of the ECG waveforms (Q onset, J point, T peak, and T end for ECG signals) and then displays colored vertical spikes superimposed on the signal marking these points with high resolution for confirmation or manual correction by the observer. The processed data are automatically written to a spreadsheet for further processing.

With this methodology accuracy and reproducibility of QT intervals and ECG parameters of dispersion of repolarization can be increased and parameters not easily measurable on paper can be determined (T wave areas).

1055-2 A New Approach of Integrating Desk Top and Palm Top Computers Data in Managing Cardiac Patients

Yzhar Charuzi, Gabriel Leonte. *Cedars-Sinai Medical Center, Los Angeles, California*

We have used a commercially available personal digital assistant(PDA), equipped with XT type processor, MS-DOS 5.0 system, 1 Mb RAM memory and 10 Mb PCMCIA RAM card. Hospital patient(pt) data was acquired into WP 5.1 wordprocessor(WP) using form files and macro programs to assure standard format and complete data set for each pt. The PDA is backed by a desk-top computer (PC) via a null modem serial interface. The pt record can be selectively printed and immediately placed in the chart as a formal history and physical (H&P), daily notes or a discharge summary, thus obviating frequently illegible handwritten notes. The PDA records can be integrated with the PC out patient records by using prompted dialog box. Through Wordperfect's 6.0 new feature, quickfinder index(QI) the pt's records can be viewed as an electronic chart derived from subdirectories of different procedures, tests, evaluations, etc.. The QI allows search and retrieval of specific information for an individual or groups of pts.

Advantages of this new integrated system are: 1) Standardization of data entry and data integrity; 2) Access to pt data independent of the chart; 3) Ability to retrieve and report selected information; 4) Rapid, concise and accurate formulation of H&P, daily notes and discharge summary with immediate printout; 5) Updated office file; 6) Instantaneous recall of information of readmitted pts; 7) Accurate billing information; 8) Queries derived from the integrated hospital and office electronic chart assist in clinical decision making and improve the quality of care of individual as well as subsets of cardiac pts.

792 Intracoronary Stents: Long Term Follow-Up

Wednesday, March 22, 1995, 2:00 p.m.–3:30 p.m. Ernest N. Morial Convention Center, Room 14

2:00

792-1 One Year Clinical Follow-up of the Benestent Trial

C. Macaya, P. Serruys, H. Suryapranata, G. Mast, S. Klugmann, P. Urban, P. den Heijer, J. Piek, R. Simon, M. Morice, P. Crean, J. Bonnier, W. Wijns, N. Danchin, C. Bourdonnec, Benestent study group. *Thoraxcenter, Dijkzigt University Hospital, Rotterdam, The Netherlands*

The Benestent Trial is a randomized study comparing elective Palmaz-Schatz stent implantation vs balloon angioplasty in de novo lesions in patients with stable angina. Data at 7 months have shown a decreased restenosis rate and reduced clinical events in the Stent group. However, it is not established if this favourable clinical outcome is maintained at one year. Consequently we have updated clinical information from 516 patients enrolled in the Benestent Trial (257 PTCA; 259 Stent). FU information was obtained in all but 4 patients (2 in the Stent group and 2 in the Balloon group). Mean follow-up was 12 months (0.3–34 months). At FU no differences were found in the 2 groups with respect to medications and functional class (CCS). Major clinical events are tabulated according to the Intention to treat principle and assigning each patient only the highest ranked event.

	7 Months		12 Months	
	Stent	Balloon	Stent	Balloon
Death	2 (0.8%)	1 (0.4%)	3 (1.2%)	1 (0.4%)
Stroke	0	2 (0.8%)	0	2 (0.8%)
MI	11 (4.2%)	10 (3.9%)	13 (5.0%)	11 (4.3%)
CABG	13 (5.0%)	10 (3.9%)	18 (6.9%)	13 (5.1%)
Re-PTCA	26 (10.0%)	53 (21.0%)♡	26 (10.0%)	54 (21.0%)♡
Any	52 (20.0%)	76 (30.0%)♠	60 (23.0%)	81 (31.5%)◇

♡ Relative risk (RR) 0.48, 95% CI (0.31–0.74), p = 0.001; ♠ RR 0.68, 95% CI (0.50–0.92), p = 0.02; ◇ RR 0.74, 95% CI (0.55–0.98), p = 0.04

This FU clinical data suggest that the benefit of elective coronary stenting is maintained at least for 1 year and results from a significantly reduced need for repeat PTCA.

2:30

792-2 Is the Anti-Restenosis Effect of Stent (vs PTCA) Greater in LAD Vessels? A Subgroup Analysis of the STent REStenosis Study

S. Chiu Wong, Ya Chien Chuang, Katherine Detre, Augusto D. Pichard, Richard A. Schatz, Richard R. Heuser, Kenneth M. Kent, Martin B. Leon. *Washington Hospital Center, Washington, DC*

In the multicenter randomized STent REStenosis Study (STRESS), stent (S) implantation has shown to reduce restenosis (RES) by 26% compared with PTCA. To determine the impact of S vs PTCA in reducing RES in various vessel locations, we analyzed the data from STRESS in LAD and non-LAD vessels.

	LAD PTCA N = 98	LAD S N = 96	Non-LAD PTCA N = 104	Non-LAD S N = 109
Final % stenosis	34 ± 15	17 ± 11†	35 ± 14	20 ± 12†
Acute gain (mm)	1.14 ± 0.47	1.62 ± 0.43†	1.32 ± 0.49	1.81 ± 0.47†
Late Loss (mm)	0.52 ± 0.55	0.78 ± 0.57*	0.34 ± 0.57	0.73 ± 0.57†
Net gain (mm)	0.59 ± 0.55	0.88 ± 0.62*	1.03 ± 0.61	1.06 ± 0.61
RES (>50% stenosis)	52.6	32.9*	29.9	29.5

*P ≤ 0.01, †P ≤ 0.0001 compared S with PTCA

In both LAD and non-LAD vessels, S (compared with PTCA) achieved a greater acute gain and resulted in a lower final % stenosis. Late loss was also greater in S than PTCA group and similar for LAD and non-LAD vessels. However, in PTCA pts, late loss was much lower in non-LAD vessels (vs LAD). Thus, the overall net gain and RES in non-LAD vessels were similar for S and PTCA, whereas the net gain was greater after S in LAD vessels and resulted in much lower RES compared with PTCA. Similarly, the difference in event-free survival (freedom from death, MI, CABG, or repeat PTCA) between S and PTCA was greater in LAD (77% vs 66%, P = 0.06) than non-LAD vessels (78% vs 72%, NS). *In Conclusion:* STRESS substudy analysis indicates 1) S provides uniformly greater improvement of angiographic results in all lesion locations compared with PTCA, 2) much greater anti-restenosis and clinical benefits in S pts within the LAD vessels, and 3) more aggressive post-S dilatation strategies (to further reduce final % stenosis) are recommended for non-LAD vessels to achieve greater differential anti-restenosis benefit for S.